

Notice of Allowability

Application No.

09/843,650

Examiner

Evan Pert

Applicant(s)

OHUCHI ET AL.

Art Unit

2829

mw

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the election filed 4-21-04.
2. ☒ The allowed claim(s) is/are 1-10.
3. ☒ The drawings filed on 01 February 2002 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species 1 (i.e. embodiments 1 and 2) in the reply filed on April 21, 2004 is acknowledged.

Applicant has identified claims 1-10 as readable on Species 1, and has not identified a pending claim generic to all embodiments; accordingly, claims 11-23, drawn to non-elected Species II, are withdrawn from consideration in this application.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Change the title to "RESIN-MOLDED SEMICONDUCTOR APPARATUS
HAVING POSTS WITH BUMPS"

Delete the section at p. 1 entitled "CROSS REFERENCE TO RELATED APPLICATION" (because this paragraph is redundant over field [30] of an issued patent unless applicant is incorporating essential subject matter "by reference" in which case an accurate translation of the referenced Japanese document is required for incorporating *essential* subject matter not in the U.S. specification).

[CONTINUED]

At p. 1, line 13, change "potable" to --portable--.

In claim 1, last line, change "a height of the conductive post" to --the height of the conductive posts-- [because the *posts* must have substantially the same height by applicant's written description].

✓
Cancel claims 11-23 (drawn to non-elected Species without an allowable generic claim).

Allowable Subject Matter

4. Claims 1-10 are allowed.
5. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 1-6, prior art fails to disclose applicant's claimed "semiconductor apparatus," which can be distinguished from prior art by the claimed "resin" with "posts" with claimed "separation" of "posts" from "device peripheral edges" by "a distance narrower than the height of the posts" (as exemplified by the depiction in Fig. 3 with a typical visual inspection advantage depicted in Fig. 5).

Regarding claims 7-10, prior art fails to disclose applicant's claimed "semiconductor apparatus", particularly characterized by the claimed (peripheral) "step" included in the "molding resin" (as exemplified by the depiction in Fig. 9 with a typical visual inspection advantage depicted in Fig. 11).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. 6,613,694 and U.S. 6,476,501 to inventors Ohuchi et al. disclose resin-molded semiconductor apparatus related to applicant's invention, but do not disclose the "distance" specified in claims 1-6 or the "step" in claims 7-10, that result in a visual inspection advantage depicted in Figs. 5 and 11.

U.S. 6,140,710 to Greenberg discloses arrangements of bumps on a flip-chip near edges, but is silent about the distance having a visual advantage depicted in Figs. 5 and 11.

U.S. 3,825,353 to Loro discusses "advantages of the so-called flip-chip," and that "bumps do not necessarily have to be close to the edge of the chip" [col. 1].

U.S. 6,228,681, U.S. 6,228,678, and U.S. 6,265,776 to Gilleo et al. are cited for teaching a flip-chip with resin 14 acting as an integrated mask (from col. 7, line 58+ of '678), such that claim 1 is anticipated excepting the claimed "distance" of posts 16 (i.e. columns) from the edge of the device 12. Gilleo et al. are textually silent about the distance from the edge and all figures show a "distance" slightly more than the "height" of the "posts" claimed as the upper limit of "distance." While one of ordinary skill might be motivated to place bumps closer to a die edge to increase packing density of the bumps, in a general sense, the motivation for combining applicant's resin limitations *with* posts *with* bumps *with* a "distance less than the height of the posts" is not clearly evident from prior art.

U.S. 5,952,726 to Liang is cited for disclosing bumps arranged with redistribution traces on a flip-chip, for an efficient flip-chip bump arrangement having bumps very close to a device edge, but is silent about other aspects of applicant's claimed invention such as the "posts" and their claimed relationship to "resin."

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Evan Pert whose telephone number is 703-306-5689. The examiner can normally be reached on M-F (7:30AM-3:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 703-308-1233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ETP
July 1, 2004


EVAN PERT
PRIMARY EXAMINER